WHAT IS CLAIMED IS :

1. A simulator for performing underwater submarine escape training in a body of water, the simulator comprising:

a submersible structure comprising:

- a bell defining a main chamber; and
- an escape tower provided over the bell and defining an escape chamber communicating with the main chamber, the escape tower having a lower hatch between the main chamber and the escape chamber, and an upper hatch separating the escape chamber from outside the submersible structure; and

means for vertically moving the submersible structure relative to the water surface of the body of water.

2. The simulator according to claim 1, wherein the submersible structure comprises a base connected under the bell.

3. The simulator according to claim 2, wherein the base comprises ballasts.

4. The simulator according to claim 2, wherein the base is connected under the bell by a plurality of removable fasteners.

5. The simulator according to claim 1, wherein the submersible structure further comprises:

means for flooding the escape chamber;

means for draining the escape chamber; and

means for venting the escape chamber during flooding and draining.

6. The simulator according to claim 5, wherein the means for flooding the escape chamber comprise a flooding valve, the flooding valve being

configured and disposed to control a flow of water into the escape chamber coming from the body of water, the flooding valve being operated using either a first flooding valve lever in the escape chamber and a second flooding valve lever in the main chamber.

7. The simulator according to claim 5, wherein the means for draining the escape chamber comprise a draining valve, the draining valve being configured and disposed to control a flow of water between the bottom of the escape chamber and a sump, the draining valve being operated using a draining valve lever in the main chamber.

8. The simulator according to claim 7, wherein the main chamber further comprises floor gratings and a sump pump, the sump pump having an inlet underneath the floor gratings to which is directed water drained from the escape chamber, and an outlet to send the water outside the submersible structure.

9. The simulator according to claim 5, wherein the means for venting the escape chamber during flooding and draining comprises an air pipe having a upper end located near the upper hatch, and a bottom end connected to a venting valve, the venting valve being configured and disposed to control a flow of air from and to the escape chamber.

10. The simulator according to claim 1, further comprising at least one inflatable float connected outside the submersible structure, the inflatable float being provided to control buoyancy of the submersible structure.

11. The simulator according to claim 1, wherein the bell comprises a side maintenance hatch between the main chamber and outside the submersible structure.

12. The simulator according to claim 1, wherein the bell comprises a bottom emergency exit hatch between the main chamber and outside the submersible structure.

13. The simulator according to claim 1, further comprising a remote supply unit, the remote supply unit being connected to the submersible structure by an umbilical cable.

14. The simulator according to claim 13, wherein the umbilical cable at least comprises a breathing air link and an electrical power link.

15. The simulator according to claim 14, wherein the umbilical cable further comprises a telecommunications link.

16. The simulator according to claim 13, wherein the remote supply unit is controlled from control panel located outside the body of water.

17. The simulator according to claim 13, wherein the submersible structure has a positive buoyancy, the means for vertically moving the submersible structure comprising means for pulling the submersible structure downwards.

18. The simulator according to claim 17, wherein the means for pulling the submersible structure downwards comprise a winch connected to the submersible structure, the winch being operated in conjunction with a cable connected to a bottom location in the body of water.

19. The simulator according to claim 18, wherein the winch comprises a hydraulic motor, the hydraulic motor being powered through hydraulic pressure lines included in the umbilical cable.

20. The simulator according to claim 18, wherein the bottom location comprises at least one pulley anchored to a fixed location.

21. The simulator according to claim 20, wherein the fixed location is a dead weight.

22. The simulator according to claim 19, wherein the hydraulic motor comprises a remotely-disengagable brake, the umbilical cable including an additional hydraulic pressure line to disengage the brake from outside the body of water.

23. The simulator according to claim 1, further comprising a traveling crane located above the body of water.

24. The simulator according to claim 1, wherein the body of water is a pool.

25. The simulator according to claim 24, wherein the pool comprises a vertical shaft downwardly extending from a bottom portion of a shallower section of the pool.

26. The simulator according to claim 1, wherein the bell comprises emergency breathing system to which are connected a plurality of individual BIBS located in the main chamber.

27. The simulator according to claim 1, further comprising an extendable rush escape skirt to be pulled downwards in the chamber from a periphery of the lower hatch of the escape tower.

28. A method of performing underwater submarine escape training in a body of water, the method comprising:

A) providing a submersible structure comprising:

- a bell defining a main chamber; and
- an escape tower provided over the bell and defining an escape chamber communicating with the main chamber, the escape tower having a lower hatch between the main chamber and the escape chamber, and an upper hatch separating the escape chamber from outside the submersible structure;

B) allowing at least one trainee and at least one instructor to be positioned inside the main chamber;

C) completely submerging the submersible structure at a given depth in the body of water; and

D) allowing the trainee to enter the escape tower and leave the submersible structure through the upper hatch.

29. The method according to claim 28, wherein in D), the trainee performs a tower escape comprising:

- wearing an inflatable escape suit;
- rehearsing a valve operation sequence;
- climbing into the escape tower;
- closing the lower hatch;
- inflating the inflatable escape suit;
- flooding the escape tower; and
- exiting through the upper hatch into the body of water.

30. The method according to claim 29, further comprising:

- manually closing an upper end of a venting pipe located near the upper hatch in the escape chamber immediately before water reaches the end the venting pipe when the escape chamber is flooded.

31. The method according to claim 28, further comprising:

providing a diver around the submersible structure in the body of water to assist the trainee.

32. The method according to claim 28, further comprising:

monitoring the training using an operator at a control center located outside the body of water; and

allowing the supervisor to aboard the training upon noticing a critical problem.

33. The method according to claim 32, wherein the monitoring comprises:

providing the operator with video and audio information using a video and audio link between the submersible structure and the control center.

34. The method according to claim 33, further comprising:

recording the video and audio information at the control center.

35. The method according to claim 32, further comprising:

monitoring air quality in the main chamber.

36. The method according to claim 28, wherein in step C), the submersible structure has a positive buoyancy, the submersible structure being submerged by pulling it downwards.

37. The method according to claim 36, wherein the submersible structure comprises a hydraulic brake operated to retain it in a submerged position, the method further comprising:

releasing the hydraulic brake from outside the body of water using an emergency hydraulic system.

38. The method according to claim 36, further comprising:

adjusting the buoyancy of the submersible structure by selectively inflating and deflating at least one inflatable float connected outside the submersible structure.

39. The method according to claim 28, further comprising:

inflating an emergency air float to bring the submersible structure at the surface of the body of water.